

STRATEGY
RESEARCH
PROJECT

The views expressed in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies. This document may not be released for open publication until it has been cleared by the appropriate military service or government agency.

THE THREAT OF NUCLEAR MOVEMENT

BY

COLONEL GERALD M. PAYNE
United States Army

DISTRIBUTION STATEMENT A:
Approved for public release.
Distribution is unlimited.

DDC LIBRARY DISPOSED 4



USAWC CLASS OF 1997
U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050

USAWC STRATEGY RESEARCH PROJECT

THE THREAT OF NUCLEAR MOVEMENT

by

Colonel Gerald M. Paine

DISTRIBUTION STATEMENT A:
Approved for public
release. Distribution is
unlimited.

Colonel George Barber

Project Advisor

The views expressed in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies. This document may not be released for open publication until it has been cleared by the appropriate military service or government agency.

U.S. Army War College
Carlisle Barracks, Pennsylvania 17013

ABSTRACT

AUTHOR: Gerald M. Paine (COL), USA

TITLE: The Threat of Nuclear Movement

FORMAT: Strategy Research Project

DATE: 7 April 1997 PAGES: 32 CLASSIFICATION: Unclassified

While weapons of mass destruction (WMD) include biological, chemical and nuclear material, this paper will focus on the nuclear component. With the collapse of the Soviet Union, nuclear material was left throughout the Commonwealth of Independent States (CIS). As these new states focused on economic and social issues, security and safety of nuclear material became secondary. This change in focus has provided conditions for the illicit movement of nuclear material and expertise. CIS admissions that illegal movement has occurred have been limited; however, material and technical expertise has been found in numerous locations. The United States and Russia have initiated many notable programs, but the potential exists for continual illicit movement. As such, continual emphasis needs to be placed on stemming the movement of nuclear material and expertise.

TABLE OF CONTENTS

ABSTRACT	iii
TABLE OF CONTENTS	v
INTRODUCTION	1
THE AVAILABILITY, DIVERSION AND MOVEMENT OF NUCLEAR MATERIAL	2
SECURITY STATUS AT FACILITIES	6
THE MOVEMENT OF EXPERTISE	11
EXPORT CONTROLS	14
UNITED STATES ACTIONS	18
CONCLUSION	21
ENDNOTES	25
BIBLIOGRAPHY	29

Introduction

For nearly fifty years, the United States and the Soviet Union were engaged in the Cold War. Each nation expended enormous resources developing and maintaining nuclear arsenals. A doctrine of Mutually Assured Destruction developed and it was "assumed neither nuclear power would launch an attack and risk nuclear retaliation."¹ Negotiations were continually ongoing to reduce nuclear arsenals; but, they were fruitless as neither side was ready to reduce theirs first.

In 1989, this situation was beginning to dramatically change. Within the Soviet Union, the political environment became extremely unstable and in December 1991 the Soviet Union ceased to exist. In its place, a weak Commonwealth of Independent States (CIS) was formed. These new states focused on developing social and economic policies while nuclear arsenals and materials became a secondary interest. This led to concerns that nations desiring to enter the nuclear club would use this unstable period to acquire former Soviet nuclear material and related technologies.

With the end of the Cold War, the threat of the two major super powers targeting each other's cities and military installations ceased. A very complex and volatile environment was developing that could severely threaten United States interests. Secretary of Defense Dick Cheney stated in February 1991:

"The greatest threat to the neighbors of the Soviet Union in the future may well come more from the Soviet

inability to control events inside the Soviet Union than it will from any conscious policy of seeking to expand their influence by military means."²

The Availability, Diversion and Movement of Fissile Material

Never before has a nation collapsed with an arsenal of nuclear weapons. The authoritarian controls, internal security networks, and close integration of civilian and military instruments of power are gone. In 1991, enormous inventories of fissile material were left in over 200 locations³ with undeveloped safeguards, inadequate export controls, and political instabilities. Weak economies failed to maintain the salary structure to which many scientists and defense industry personnel had been accustomed. These conditions were creating an environment that could allow illicit movement of fissile material.

Since 1991, numerous cases have been reported of illicit movement of nuclear material from the former Soviet Union.⁴ The majority of the reports have been hoaxes. However, eleven cases of illegal movement of fissile material have been brought to the attention of the international community.⁵ Even though the leadership of the CIS has discounted these, many people and organizations are confident the thefts did occur.

Forty kilometers southwest of Moscow at the Luch Scientific Production Association in Podolsk, a chemical engineer took one-and-a-half kilograms of weapons grade highly enriched uranium

(HEU) from the facility between May and September 1992. He removed the material on 20-25 separate occasions placing uranium oxide in glass jars. His motivation came from reading an article in *Komsomolskaya Pravada* about the fortunes made selling nuclear material. He was convicted, received three years probation and released from prison. In this case, the Ministry of Atomic Energy (MINATOM) publicly denied the diversion occurred directly contradicting public testimony.

The next case involved two naval servicemen from the storage facility of the Northern Fleet Naval Base at Andreeva Guba forty kilometers from the Norwegian border. They removed 1.8 kilograms of HEU and stated they were operating under the instructions of two naval officers. At the trial, insufficient evidence existed to convict the officers, but the enlisted personnel received prison terms up to five years.

The third case took place at the Sevmorput Shipyard near Murmansk, one of the Russian Navy's main nuclear fuel storage facilities. Two individuals entered the facility through an unprotected gate, climbed through a hole in the fence surrounding a storage area, and broke the lock on a back door. Once inside, assemblies were broken from a fuel reactor and 4.5 kilograms of uranium was removed. This theft was discovered by guards who noticed the back door was left open. The individuals kept the material for six months before requesting help in selling it. This action led to their arrest and subsequent trial. It was noted the

thieves had not developed a plan to dispose of the material. Both received three-and-one half years in prison. The military prosecutor commented that this theft "could have been concealed for 10 years or longer if the back door had not attracted the guard's attention."⁶

These first three instances involved confirmed cases of theft, but the material was seized prior to departing the former Soviet Union. The next cases of illegal transit have been confirmed; however, the fissile material had been exported prior to authorities making an arrest.

In May 1994 at Tengen, Germany, local authorities were investigating an individual suspected of counterfeiting. During this investigation, 5.6 grams of nearly pure plutonium-239 was inadvertently discovered in the garage. A number of unanswered questions remain pertaining to this case, but it is significant in that it did involve a police sting operation.

In August 1994, a suitcase from Moscow was found in the Munich airport containing 560 grams of mixed oxides of uranium and plutonium. This was the largest seizure of weapons-grade material recovered in the West. Two people from Spain and a Colombian national were arrested. This case was a sting operation initiated by the German authorities who had artificially created the demand. MINATOM authorities stated this operation was staged to embarrass the Russian nuclear industry. During the trial, German authorities did acknowledge knowing about the plutonium on the

airplane. Officials in Moscow were not informed to preclude possible leaks between Russian criminal groups and security personnel. Due to the German authorities enticing the parties, light sentences were given.

The next significant case was the seizure of 800 milligrams of HEU in August 1994 in Landshut, Germany. A German real estate dealer was arrested with five people from Slovakia and the Czech Republic. It is believed this material was from a naval or research reactor. The principle significance of this case is the material was from the same source as that discovered in Prague four months later.

In December 1994, Prague police found 2.72 kilograms of HEU in the back seat of a car owned by a Czech national. He had worked at the Nuclear Research Institute at Rez and at two nuclear power stations. Due to poor wages, he left these positions. There were two others initially arrested possessing nuclear experience. One was from Belarus and the other was from Ukraine. In March 1995, the media reported two more individuals were arrested, one reportedly a police officer. It is believed this material was supplied by criminals and was from stocks used for Russia's Northern Fleet.

The remainder of the cases have not been thoroughly verified; however, there is little doubt the thefts occurred. Of particular note is the one discovered in 1993 at Vilnius, Lithuania. This is due to the possible complicity of government authorities.

The other two occurred in St. Petersburg, Russia and Kiev, Ukraine.

From these cases, notable patterns have been observed.⁷ First, reported proliferation cases remain small in number, but the quantity of material stolen has increased. These thefts have shown people are becoming more sophisticated by taking gram and kilogram quantities. Second, there has not been any evidence indicating the fissile material is from weapons or warhead stocks. Third, the thefts were principally conducted by insiders working on their own, willing to take significant risks, and not having definitive plans to dispose of the material. Last, investigations have found no evidence organized crime is directly involved. These factors combined with the enormous quantities of fissile material and the lack of adequate control procedures have made security of the CIS nuclear infrastructure of paramount importance.

Security Status at Facilities

In the beginning of the Soviet Union's nuclear program, heavy emphasis was placed on internal security. Secret cities were established to work on nuclear programs. These cities were located in isolated areas, self-contained and well protected. Personnel went through an intensive screening process and their activities were closely monitored. For those who violated any of

the procedures, severe penalties were enforced. These personnel were economically taken care of and respected for the work accomplished. With the collapse of the Soviet Union, this situation rapidly changed. Economic conditions became difficult as inflation and loss of work eroded the prestige of scientific and defense industry personnel. These conditions led to concerns regarding the security at the nuclear facilities.

One of the more important measures involved in security is the accounting of nuclear material. After visiting some of the CIS facilities, the Government Accounting Office (GAO) released a report in March 1996 that stated "the newly independent states may not have complete and accurate inventories of their nuclear materials because the Soviet Union did not conduct complete and comprehensive physical inventories at their nuclear facilities."⁸ The GAO report further stated Russia and six other newly independent states did not know the exact locations of their material.⁹

From official Russian channels, government personnel emphasize security at nuclear complexes is adequate and deny any fissile material has been stolen. Russian officials complain the reports of smuggling have been created by the German Government using sting operations. They claim the reports created an artificial demand and were an attempt to embarrass the Russian Government.¹⁰ Others have complained that the adverse publicity was created by the United States in order to seize control of Russian

nuclear facilities. Georgi Kehurov, a MINATOM spokesman, has stated "we will never agree to Russia's nuclear potential and weapons being controlled by the United States."¹¹ Russian officials have claimed "publicly that the government has taken a thorough inventory of its fissile material and that nothing is missing."¹² Also, a MINATOM spokesman stated to a group of journalists "that the material missing at MINATOM facilities is not in the realms of tons of kilograms, but in grams. You might not agree with this, but it is a fact."¹³ In the same vein, Andre Garinski, a top official at Moscow's Kurchatov Institute, has stated security around active and decommissioned warheads remains strong.¹⁴

Security measures are important to the governments of the CIS, but there are numerous reports contradicting the above comments. As early as 1991, Soviet Prime Minister Nikolai Ryzkhov stated "the disintegration of our country would have terrible consequences for all. I regard this danger as very great. If I were a foreign politician I would also be worried."¹⁵ The disintegration of the Soviet system is particularly a concern regarding the security and accounting of fissile material. Inventories of fissile material were conducted, but the standards are inadequate. Inventory procedures allowed for a permissible loss and as long as the final product stayed within a proscribed range, the material was considered on hand. This agrees with official state-

ments that production was the emphasis rather than inventory or security measures.¹⁶

Other reports provided by top officials take exception to the statements of their leaders. Their concern is that the reality of the situation is much worse than publicly stated. From 1993 to 1995, the Military General Prosecutor's Office of the Russian Federation conducted inspections at the nuclear facilities of MINATOM and the Defense Ministry. The results produced unsatisfactory observations on facility security.¹⁷ This corresponds with the statements of National Security Advisor Yuri Baturin after the Moscow Nuclear summit in April 1996. He stated "that the current level of nuclear security in Russia - in particular, nuclear material control, accounting, and physical protection - does not meet acceptable international requirements."¹⁸ At the same conference, Russian President Boris Yeltsin admitted general concerns over nuclear security and the possible diversions from nuclear facilities.¹⁹ In a visit to the Kurchatov Institute of Atomic Energy in Moscow, United States Department of Energy personnel found 160 pounds of weapons-grade plutonium in lockers secured with a tiny chain.²⁰ While visiting another location, a different United States team observed cameras and other security devices mounted on the walls. Upon questioning the workers, it was learned the items had been placed on the walls for the visit and would be removed for fear of theft.²¹

Another security concern is the military guarding nuclear facilities. At the court case for the theft of fissile material from the Murmansk Shipyard, the military prosecutor stated "potatoes were guarded better than naval fuel."²² Military personnel are concerned over the loss of status, pay and housing. This was a contributing factor in the discovery of an SS-25 nuclear battery that was deserted for several hours while the crew searched for food.²³ In the summer of 1994, acting Chief Military Procurator G. N. Nosov identified criminal actions within the Strategic Rocket Forces.²⁴ An officer had established a currency exchange within his quarters and was selling food at inflated prices. It has also been reported officers of the Long-Range Aviation Division had transformed their base into a transshipment point for goods between cities in the CIS and China. The profits were shared among the pilots and their crews.²⁵ The loss of prestige and reduction of pay of the military has increased concerns that fissile material or equipment could be diverted while a government guard force is on site.

One of the primary concerns has been the diversion of fissile material, but the related security of dual-use equipment is just as important. While investigating a theft of HEU from a military base near Moscow in September 1995, a Central Intelligence Agency (CIA) report identified a number of gyroscopes, a central component of a missile guidance system, as missing. In an effort to find these items, informants were used throughout the

CIS, Europe, and the Middle East. In October 1995, the CIA learned that the items were in a shed at the Amman Airport in Jordan waiting shipment to Iraq. The Jordanian Government publicly returned the items to the United Nations in November 1995. After this, it was discovered that additional gyroscopes had been removed and delivered to a major missile research laboratory (In al-Haytham) outside Baghdad. As for the investigation into the diversion of the nuclear material, it has still not been recovered.²⁶ In addition to the movement of nuclear material and related technologies, the movement of those responsible for the production is also of concern.

The Movement of Expertise

The movement of personnel with nuclear expertise from the former Soviet Union is a significant issue. These personnel were held in high esteem and were taken care of by the state. It has been estimated there were more than one million scientists and engineers working in the defense arena and 60,000 should be considered as a proliferation concern.²⁷ Within this number, the majority have expertise in nuclear or aerospace technologies. With the collapse of the Soviet system, the same concerns affecting the military also apply to these personnel. Their economic situation has been severely degraded as has the working conditions within laboratories.

The majority of these personnel do not desire to move as they have a great pride in their country. With their nuclear expertise, they have first hand knowledge of the results of its use. They feel that they have helped in their own way to stop the spread of proliferation by not moving. Yet, there is the concern that idleness will create a desire to move, to remain employed and to support their families.

Due to the lack of funding, laboratories have fallen into disrepair and in some instances have ceased to operate, allowing scavengers to remove material. According to a report from the Institute of Experimental Physics in Sarov, forced reductions in the labor force has begun. It was reported that 5,000 people have left the town in search of work elsewhere.²⁸ With the existence of these economic conditions, the concern of movement of this expertise is continuing to increase.

Transition of these personnel can be grouped into three major categories: change to another type work, move to another country, or to have part-time work. The first group are those who have stayed in country but have started their own business. The next group poses the greatest concern in that they will work for anyone, anywhere as long as they are paid. The last group has taken their expertise to the computer with the use of the modem. Their expertise is being received by many while they work at home. The employment of the scientific community by those from other countries is a significant concern.

In United States Senate hearings on 13 March 1996, Senator Sam Nunn provided information gathered by his staff on the movement of former Soviet expertise. A letter was provided from a Hong Kong company that was found in the Middle East. It states, "We have detailed files of hundreds of former Soviet Union experts in the field of rocket, missile and nuclear weapons. These weapons experts are willing to work in a country which needs their skills and can offer reasonable pay."²⁹ There are countries desiring to enter the nuclear community that are seeking former Soviet scientists to assist in developing their nuclear programs.

Since 1989, forty nuclear specialists have emigrated to Israel. In 1992, former Soviet experts were discovered working in other countries.³⁰ The first is of Russian scientists working at the Mexican National Autonomous University of Mexico's Institute of Physics. The second points to 450 personnel working in Cuba on a nuclear power plant. Third, a nuclear physicist from the Dubna Nuclear Research Center and fifty scientists with expertise in lasers and multiple entry rockets are working in Libya. Continuing reports have been received of former Russian experts working on nuclear projects in other countries. In 1994, three scientists were reportedly working for the China-Russia Nuclear Company in Shenzhen, China. Two hundred nuclear specialists were found in 1995 working at a power plant in Iran. Due to the continual movement of expertise and equipment, it is essential to enact export controls in the CIS.

Export Controls

Testimony before the United States Senate on 13 March 1996 included "the implementation of export controls in the new states of the former Soviet Union has the potential... of being one of the most significant and cost-effective accomplishments in the post-Cold War era in support of United States and global security interests."³¹ The Russians have begun to initiate export controls, establish agencies, and develop control lists to regulate weapons and related technologies. These actions are essential as government officials recognize the importance of export controls to state security. Russian Foreign Minister Primakov has stated "the problem of the proliferation of weapons of mass destruction affects the immediate interests of Russia, a situation in which new states possessing weapons of mass destruction on the perimeter of Russian borders looks unacceptable."³² In addition, another Russian official has stated "that is why setting up an effective export control system is a strategic imperative for this country, a matter of vital importance and even national survival."³³

The Russian Government is taking action to halt the movement of fissile materials and personnel with nuclear expertise. The Export Control Division of the Russian Ministry of Economics is one of the primary agencies working on the development of export controls. In cooperation with the Ministry of Foreign Affairs,

presidential decrees were initiated with one of the more important being Decree No. 388.³⁴ This provides the principal legal basis for the export control structure in Russia. Controls were introduced to prevent damage to their national interests by regulating the export of items used to develop WMD and delivery systems. In addition, the Russian Federation Export Control Commission was established to regulate the export of specified material. A special commission has been created to improve security at facilities, to implement or assist in developing laws to improve accounting and control of fissile material, and to improve licensing procedures.³⁵

Legislation was enacted on 30 May 1991 that became effective 1 January 1993 to control the movement of personnel with nuclear expertise. Provisions were established precluding anyone with access to state secrets from emigrating for five years.³⁶ In addition, the Russian Customs Committee has received prioritized funding for improving border controls that have increased the number of personnel working at border locations.

Export controls have been initiated and are slowly beginning to improve the situation. In October 1995, a former defense minister of Kazakhstan and a senior defense official were sentenced to eight and four year jail terms, respectively, for illegally exporting weapons.³⁷ In February 1996, an acting Russian Prosecutor General was imprisoned for illegal trade and receiving bribes.³⁸ States of the CIS are trying to build new control sys-

tems, but it has been difficult to quickly change the existing system.

Throughout the CIS, there have been difficulties in implementing controls. There is not one agency controlling the exports in Russia. The agencies that have been established are under-funded and are not a match for existing export oriented activities.³⁹ The evolving business cultures have found methods to circumvent the system and some officials turn away as they know currency is needed to improve the economic situation. Disagreements between government agencies have stifled corrective actions. In September 1994, President Yeltsin issued a decree that the State Commission for Nuclear and Radiation Safety Supervision (known in Russian as Gosatomnadzor or "GAN") would be the lead nuclear regulatory agency and ordered MINATOM to work with GAN. MINATOM has resisted this authority and the situation is still not resolved.⁴⁰ The CIS has made improvements but is not able to correct the situation without international help.

Some CIS states have signed various international agreements to reduce nuclear proliferation. The Nuclear Suppliers Group, the Missile Technology Control Regime, and the Wassenaar Arrangement deal with controlling the movement of weapons and dual-use items. In addition to these, the Comprehensive Test Ban Treaty (CTB) was approved by the United Nations on 10 September 1996.⁴¹

The CTB has ended forty years of efforts to achieve an agreement on ending nuclear testing. In 1963, the Limited Test

Ban Treaty was the first agreement reached to prohibit all nuclear tests in the atmosphere, outer space, and underwater, but did allow for underground explosions. In 1974, the Threshold Test Ban Treaty was signed banning underground explosions with yields greater than 150 kilotons. The CTB states no nuclear test explosion is to occur, and it demonstrates the resolve of the five major powers to move towards disarmament. An elaborate technical verification system was established including on-site verification of any suspected area. Even though India has not signed the treaty, it is expected the overwhelming support received in the United Nations will place international pressure on India to abide by the ban.⁴²

Action is being taken at all levels of government to control the movement of nuclear material; however, in the CIS, these steps are only in their infancy. With the continued economic and social conditions, there still is an attractiveness to become involved in the illicit movement of fissile material for a quick profit. The border of the CIS is immense, and there are too many routes out of the country to neighboring states, especially those desiring nuclear material. An example of this concern is the fast breeder reactor in Akau, Kazakhstan on the Caspian Sea and the growing Iranian presence in the area.⁴³ Even with controls in place, movement of fissile material is still occurring, and it is imperative the United States continues financial and technical assistance to the CIS.

United States Actions

The United States has recognized the importance of stemming the proliferation of WMD. In A National Security Strategy Of Engagement And Enlargement, the proliferation of WMD is identified as a major challenge to United States security.⁴⁴ The National Military Strategy has characterized the proliferation of WMD as a principal danger to the United States.⁴⁵ In 1994, President Clinton used his Constitutional authority to declare a national emergency regarding the proliferation of WMD.⁴⁶

The concerns associated with nuclear safety and security had significantly risen in the Soviet Union due to the coup attempt in August 1991. When President Gorbachev asked for Western assistance in dismantling the nuclear inventory, President Bush suggested the United States and the Soviet Union work together. In November 1991, the United States responded by enacting the Cooperative Threat Reduction Program (Nunn-Lugar).⁴⁷ This legislation focused on the importance of accounting and physical protection of fissile material. The basic tenants of the Nunn-Lugar Program are: dismantling and destroying WMD, safeguarding WMD until destroyed, preventing diversion of expertise, converting of defense industries to peaceful endeavors, and expanding defense and military contracts.⁴⁸ Funding began for this program in FY92 as the Department of Defense was authorized to use \$400M and has continued with various amounts through FY96. For FY97, \$365M has been

authorized. To date, total proposed obligations for this program amount to \$1.53B with \$1.1B obligated through signed contracts.⁴⁹ In its 1996 report, the GAO recognized improvements made in security and accounting procedures at the installations visited.⁵⁰

An example of these funds being used to enhance security of fissile material took place in Kazakhstan in November 1994. There were 600 kilograms of HEU discovered at a reactor site that was terminated after the Soviet Union dissolved. A concern existed over the security of the facility and the ability of the local government to guard the material. To prevent rogue states from acquiring the material, the HEU was bought and transferred to the United States.

One of the components of the Nunn-Lugar Program is converting defense industries to peaceful measures through the International Science and Technology Center. The primary purpose is to provide peaceful employment opportunities to defense industry scientists and engineers. Through April 1996, 236 projects have been approved employing about 12,500 personnel up to three years. To date, funds committed for this program amount to \$98 million.⁵¹ Two centers have been established with the first one in Moscow and the second in Kiev.

Through this endeavor, cities constructed by Joseph Stalin for defense industries have been converted to peaceful endeavors.⁵² Four examples are:

<u>Secret City</u>	<u>Previous Mission</u>	<u>Current Mission</u>
Novouralsk	uranium	catalytic converters
Tryokhgornii	warheads	telephones
Zelenogorsk	uranium	audio/videocassettes
Zhelenogorsk	plutonium	televisions

Former Secretary of Defense Perry has stated the Nunn-Lugar Program is a win-win-win situation.⁵³ This program has assisted in the dismantling of weapons, turned talent and technology to commercial products, and US firms have begun to establish markets in the CIS.

In a related program conceived by Senator Pete Domenici, the Industrial Partnering Program (IPP) is intended to stem proliferation by finding jobs for unemployed scientists and engineers. This program is overseen by the Department of Energy and is of mutual benefit to the United States and the CIS. IPP projects have involved lab-to-lab and industrial partnerships with the intent of guiding Russia's scientific institutes towards economic self-sufficiency. In a March 1996 report to Congress, the IPP program had engaged more than 2,000 personnel in 200 projects at sixty institutes.⁵⁴

Even with the successes of the Nunn-Lugar Program, there continues to be the concern that the program has not achieved the results initially envisioned. At the programs inception, funds were not expeditiously obligated as there was apprehension concerning the ability of the Russians to properly use the funds.

Contracts were slow in implementation to ensure compliance and to work through the uncertainties of this program with the new states. There was apprehension on the Russian part as the program called for the use of United States companies and equipment. Of foremost concern was the opening of the secret cities to United States personnel. Once the program was understood, Nunn-Lugar has made significant contributions and will continue to be an essential component of the programs stemming the threat of nuclear proliferation.

Conclusion

There are many programs to assist in stemming the threat of nuclear proliferation. These programs have been initiated in the CIS, the United States, and in the international arena; yet, the illicit movement of fissile material is still occurring. Senator Sam Nunn has stated 90% of the responsibility to manage this concern is up to the individual states of the CIS as their national security is at stake.⁵⁵ Assistance and incentives can be provided, but the United States cannot solve their problems. There have been successful programs initiated, and they must be continued.

It is not time to stop United States funding support particularly since it has been estimated it will take at least ten years for Russia to dismantle the weapons agreed upon.⁵⁶ The

United States must recognize the importance to our national interests of the criticality of stemming nuclear proliferation. It is true that the major responsibility lies with the Russian Government, but WMD has been stated as the number one security threat to this country.

Due to this, two recommendations are provided. It is imperative funding for the Nunn-Lugar Program be continued. This does not mean that a massive increase in funding should be applied to the program. It does mean a comprehensive review of the program should be initiated. The results would be presented to Congress with a recommendation of the funding required to protect the security interests of the United States. Next, the United States and the international community need to reach an understanding and agreement on the importance of stemming the nuclear threat. It is difficult for one nuclear power to state there is a concern about the safety and security of nuclear facilities while another voices an opposite opinion. French President Jacques Chirac stated in April 1996 that "While...statements (on the poor safety and security at Russian nuclear facilities) might have had substance four years ago, they can be called nonsense today."⁵⁷ There must be a unified approach in the international community as there are too many incidents indicating the threat is real.

These two simple recommendations should be undertaken as the threat is real and will continue to be a concern until all nuclear material is properly secured. It will be too late to debate

this issue once a nuclear device has been exploded by a rogue state or a terrorist group and family members question United States actions taken, or should have been taken, to stem the proliferation of nuclear material and expertise.

ENDNOTES

¹Office of the Secretary of Defense, Proliferation: Threat and Response. (Washington: US Government Printing Office, April 1996): iii.

²David C. Morrison, "Loose Soviet Nukes: A Mountain or a Molehill?" Arms Control Today, 21, no. 3 (April 1991): 15.

³In 1989, there were over 600 storage sites which were consolidated to 200 by 1991, subsequently reduced to less than 100 in 1995 in an effort to reduce security and safety concerns. Jessica E. Stern, "U.S. Assistance Programs For Improving MPC&A In The Former Soviet Union," The Nonproliferation Review 3, no. 2 (Winter 1996): 20.

⁴Center for Strategic and International Studies, The Nuclear Black Market: Organized Crime Project (Washington: The Center for Strategic and International Studies, 1996): 13.

⁵Congress, Senate, Permanent Subcommittee on Investigations of the Committee on Governmental Affairs United States Senate, Global Proliferation of Weapons of Mass Destruction, 104th Cong., 2d sess., 13,20,22 March 1996, 25.

⁶William C. Potter, "Before the Deluge? Assessing the Threat of Nuclear Leakage From the Post-Soviet States," Arms Control Today 25, no. 8 (October 1995): 10.

⁷The Nuclear Black Market: Global Organized Crime Project, 10-11.

⁸United States Government Accounting Office, Report to Congressional Requesters, Nuclear Nonproliferation: Status of U.S. Efforts to Improve Nuclear Material Controls in Newly Independent States, (Washington, D.C.: GAO, March 1996), 5.

⁹United States Government Accounting Office, Testimony Before the Permanent Subcommittee on Investigations, Committee on Governmental Affairs, U.S. Senate, Nuclear Nonproliferation: U.S. Efforts to Help Newly Independent States Improve Their Nuclear Material Controls, (Washington, D.C.: GAO, 13 March 1996), 1.

¹⁰Potter, "Before the Deluge," 11.

¹¹Malcolm Gray and William Lowther, "The 'loose nukes'," Maclean's 109, Iss. 17 (22 April 1996): 25. UMI ProQuest, General Periodicals Ondisc, item 02780906.

¹²Stern, "Improving MPC&A," 28.

¹³Ibid.

¹⁴Gray and Lowther, "The 'loose nukes'," 25.

¹⁵Morrison, "Loose Soviet Nukes," 19.

¹⁶Stern, "Improving MPC&A," 28.

¹⁷Vladimir A. Orlov, "The Moscow Summit and the Status of Russia's Smuggling Threat," The Nonproliferation Review 3, no. 3 (Spring-Summer 1996): 83.

¹⁸Ibid., 81.

¹⁹Ibid., 80.

²⁰Amanda Bichsel, "How the GOP Learned to Love the Bomb," Washington Monthly 27, Iss. 10 (October 1995): 28.

²¹Guy B. Roberts, Five Minutes Past Midnight: The Clear and Present Danger of Nuclear Weapons Grade Fissile Materials (US Air Force Academy, Colorado: USAF Institute for National Security Studies, February 1996), 7.

²²Potter, "Before the Deluge," 10.

²³Ibid., 13.

²⁴Graham H. Turbiville, Jr., "Weapons Proliferation and Organized Crime: Russian Military Dimensions," Airpower Journal X, SE (Special Edition 1996): 21.

²⁵Ibid.

²⁶Gray and Lowther, "The 'loose nukes,'" 25.

²⁷Congress, "Global Proliferation," 53.

²⁸Ibid., 54.

²⁹Ibid., 7.

³⁰R. Adams Moody, "Reexamining Brain Drain From the Former Soviet Union," The Nonproliferation Review 3, no. 3 (Spring-Summer 1996): 94.

³¹Congress, "Global Proliferation," 36.

³²Ibid., 37.

³³Ibid.

³⁴William C. Potter, "Nuclear Exports From the Former Soviet Union: What's New, What's True," Arms Control Today 23, no. 1 (January/February 1993): 6.

³⁵The complete name of the commission is the State Program of the Russian Federation for Creating and Equipping with Physical Protection Systems Facilities of the Nuclear Weapons Complex, of the Atomic Industry, of Power Engineering and Research Facilities of the Atomic Energy Ministry of the Russian Federation and Facilities of the Defense Ministry of the Russian Federation. Orlov, "Moscow Nuclear Summit," 84.

³⁶Moody, "Reexamining Brain Drain," 92.

³⁷Congress, "Global Proliferation," 38.

³⁸Ibid.

³⁹Ibid., 37.

⁴⁰Government Accounting Office, "Nuclear Nonproliferation: Status," 30.

⁴¹John M. Goshko, "U.N. Approves Treaty, 158-3, That Would Ban Nuclear Tests," Washington Post, 11 September 1996, sec. A, p. 20.

⁴²John M. Goshko, "India, Pakistan Balk at Test Ban," Washington Post, 10 September 1996, sec. A, p. 19.

⁴³Congress, "Global Proliferation," 30.

⁴⁴The White House, A National Security Strategy Of Engagement and Enlargement, (Washington: U.S. Government Printing Office, February 1996), i.

⁴⁵Chairman of the Joint Chiefs of Staff, National Military Strategy of the United States of America, (Washington: U.S. Government Printing Office, 1995), i.

⁴⁶The laws included the International Economic Powers Act (50 U.S.C. 1601 et seq.), the Arms Export Control Act, as amended (22 U.S.C. 2751 et seq.), Executive Orders Nos. 12851 and 12924, and section 301 of Title 3, United States Code. President, "Executive Order 12938 - Proliferation of Weapons of Mass Destruction," Weekly Compilation of Presidential Documents 30, Iss. 46 (21 November 1994): 2386. UMI ProQuest, General Periodicals Ondisc, item 02170720.

⁴⁷US Arms Control and Disarmament Agency, Report to Congress, "Controlling Nuclear Weapons," Threat Control Through Arms Control (Washington: 1994): 17.

⁴⁸William J. Perry, Annual Report to the President and the Congress, (Washington: U.S. Government Printing Office, March 1996), 64.

⁴⁹"Factile: U.S. Security Assistance to the Former Soviet Union," Arms Control Today, 26, no. 7 (September 1996): 25.

⁵⁰Government Accounting Office, "Nuclear Nonproliferation: Status," 26.

⁵¹The Monterey Institute of International Studies and The Carnegie Endowment for International Peace, Nuclear Weapon and Sensitive Export Status Report: Nuclear Successor States of the Soviet Union, no. 4 (May 1996): 57.

⁵²Patricia Kranz, "From Plutonium to Pogo Sticks," Business Week, Iss. 3450 (13 November 1995): 6. UMI ProQuest, General Periodicals Ondisc, item 02605404.

⁵³Dunbar Lockwood, "The Nunn-Lugar Program: No Time To Pull the Plug," Arms Control Today 25, no. 5 (June 1995): 10.

⁵⁴Paul Mann, "Post-Cold War Nightmare, Deficit Pressures Hobble Anti-Proliferation Efforts," Aviation Week & Space Technology 144, no. 25 (17 June 1996): 64.

⁵⁵Congress, "Global Proliferation," 7.

⁵⁶Susanne Kopte, Michael Renner, and Peter Wilke, "The Cost Of Disarmament: Dismantlement Of Weapons And The Disposal Of Military Surplus," The Nonproliferation Review 3, no. 2 (Winter 1996): 43.

⁵⁷Orlov, "Moscow Nuclear Summit," 80.

BIBLIOGRAPHY

- Bichsel, Amanda. "How the GOP Learned to Love the Bomb." Washington Monthly 27, Iss. 10 (October 1995): 26-30. UMI ProQuest, General Periodicals Ondisc, item 02519164.
- Bukharin, Oleg. "U.S.-Russian Cooperation in the Area of Nuclear Safeguards." The Nonproliferation Review 2, no. 1 (Fall 1994): 30-37.
- Clinton, William J. A National Security Strategy of Engagement and Enlargement. Washington, D.C.: United States Government Printing Office, February 1996.
- Domenici, Pete V. "Countering Weapons of Mass Destruction." Washington Quarterly 18, Iss. 1 (Winter 1995): 145-152. UMI ProQuest, General Periodicals Ondisc, item 02327380.
- Goshko, John M. "India, Pakistan Balk at Test Ban." Washington Post, 10 September 1996, sec A, p. 19.
- Goshko, John M. "U.N. Approves Treaty, 158-3, That Would Ban Nuclear Tests." Washington Post, 11 September 1996, sec A, p. 20.
- Gray, Malcolm and William Lowther. "The 'loose nukes'." Maclean's 109, Iss. 17 (22 April 1996): 24-26. UMI ProQuest, General Periodicals Ondisc, item 02780906.
- Kopte, Susanne, Michael Renner, and Peter Wilke. "The Cost of Disarmament: Dismantlement of Weapons and the Disposal of Military Surplus." The Nonproliferation Review 3, no. 2 (Winter 1996): 33-45.
- Kranz, Patricia. "From Plutonium to Pogo Sticks." Business Week, Iss. 3450 (13 November 1995): 6. UMI Proquest, General Periodicals Ondisc, item 02605404.
- Lockwood, Dunbar. "The Nunn-Lugar Program: No Time To Pull the Plug." Arms Control Today 25, no. 5 (June 1995): 8-13.
- Mann, Paul. "Deficit Pressures Hobble Anti-Proliferation Efforts." Aviation Week & Space Technology 144, no. 25 (17 June 1996): 64.
- _____. "Mass Weapons Threat Deepens Worldwide." Aviation Week & Space Technology 144, no. 25 (17 June 1996): 58-61.
- _____. "Nuclear Smuggling Called Direct Threat to U.S."

Aviation Week & Space Technology 144, no. 25 (17 June 1996): 62-63.

Maslin, Eugeni P. "Cooperation Between the Russian Ministry of Defense and the U.S. Defense Department on Nuclear Weapons Safety." The Nonproliferation Review 3, no. 1 (Fall 1995): 76-78.

Monterey Institute of International Studies and The Carnegie Endowment for International Peace. Nuclear Successor States: Soviet Union no. 4 (May 1966) Monterey Institute of International Studies, Monterey, California and The Carnegie Endowment for International Peace, Washington, D.C.

Moody, R. Adams. "Reexamining Brain Drain From The Former Soviet Union." The Nonproliferation Review 3, no. 3 (Spring-Summer 1996): 92-97.

Morrison, David C. "Loose Soviet Nukes: A Mountain or a Molehill." Arms Control Today 21, no. 3 (April 1991): 15-19.

Mueller, Harold. "Fissile Material Smuggling: Politics, Hype and Reality." Arms Control Today 24, no. 10 (December 1994): 7-10.

Orlov, Vladimir A. "The Moscow Nuclear Summit and the Status of Russia's Smuggling Threat." The Nonproliferation Review 3, no. 3 (Spring-Summer 1996): 80-85.

Perry, William J. Annual Report to the President and the Congress. Washington, D.C.: United States Government Printing Office, January 1994.

Perry, William J. Annual Report to the President and the Congress. Washington, D.C.: United States Government Printing Office, February 1995.

Perry, William J. Annual Report to the President and the Congress. Washington, D.C.: United States Government Printing Office, March 1996.

Perry, William J. Proliferation: Threat and Response. Washington, D.C.: United States Government Printing Office, April 1996.

Potter, William C. "Before the Deluge? Assessing the Threat of Nuclear Leakage From the Post-Soviet States." Arms Control Today 25, no. 8 (October 1995): 9-16.

Potter, William C. "Nuclear Exports From the Former Soviet Union:

"What's New, What's True." Arms Control Today 23, no. 1 (January/February 1993): 3-10.

Roberts, Guy B. Five Minutes Past Midnight: The Clear & Present Danger of Nuclear Weapons Grade Fissile Materials. US Air Force Academy, Colorado: USAF Institute for National Security Studies, February 1996.

Roberts, Guy B. "Nuclear Weapons-Grade Fissile Materials: The Most Serious Threat To US National Security Today?" Airpower Journal X, SE (Special Edition 1996): 4-16.

Shalikashvili, John M. National Military Strategy of the United States of America. Washington, D.C.: United States Government Printing Office, 1995.

Scheinman, Lawrence and David A. V. Fischer. "Managing the Coming Glut of Nuclear Weapon Materials." Arms Control Today 22, no. 2 (March 1992): 7-12.

Shields, John M. "Conference Findings on the Nunn-Lugar Cooperative Threat Reduction Program: Donor and Recipient Country Perspectives." The Nonproliferation Review 3, no. 1 (Fall 1995): 66-75.

Snell, Albert E. and Edward J. Kevsenkothen. "Mass Destruction Weapons Enter Arsenal of Terrorists." National Defense 79, No. 504 (January 1995): 20-21.

Stern, Jessica E. "U. S. Assistance Programs for Improving MPC&A In The Former Soviet Union." The Nonproliferation Review 3, no. 2 (Winter 1996): 17-32.

Taubes, Gary. "The Defense Initiative of the 1990s." Science 267, Iss. 5201 (24 February 1995): 1096-1100. UMI ProQuest, General Periodicals Ondisc, item 02282483.

The Center for Strategic and International Studies. The Nuclear Black Market: Global Organized Crime Project. Washington: The Center for Strategic and International Studies, 1996.

Turberville, Graham H., Jr. "Weapons Proliferation and Organized Crime: Russian Military Dimensions." Airpower Journal X, SE (Special Edition 1996): 17-24.

US Arms Control and Disarmament Agency. Threat Control Through Arms Control: Report to Congress. Washington, D.C.: US Arms Control and Disarmament Agency, 1994.

U.S. Congress, Senate. Hearings Before the Subcommittee on

European Affairs of the Committee on Foreign Relations
United States Senate. Loose Nukes, Nuclear Smuggling, and
the Fissile-Material Problem in Russia and the NIS. 104th
Cong., 1st sess., 22, 23 August 1995.

U.S. Congress, Senate. Permanent Subcommittee on Investigations
of the Committee on Governmental Affairs United States Sen-
ate. Global Proliferation of Weapons of Mass Destruction.
Part II, 104th Cong., 2d sess., 13, 20, 22 March 1996.

U.S. Government Accounting Office. Nuclear Nonproliferation:
Status of U.S. Efforts to Improve Nuclear Material Controls
Newly Independent States: Report to Congressional Request-
ers. Washington, D.C.: United States General Accounting Of-
fice, March 1996.

U.S. Government Accounting Office. Nuclear Nonproliferation: U.S.
Efforts to Help Newly Independent States Improve Their Nu-
nuclear Material Controls: Testimony Before the Permanent Sub-
committee on Investigations, Committee on Governmental Af-
fairs, U.S. Senate. Washington, D.C.: United States Govern-
ment Accounting Office, 13 March 1996.

U.S. President. 1994. Executive Order 12938. "Proliferation of
Weapons of Mass Destruction." Weekly Compilation of Presi-
dential Documents 30, no. 46 (21 November 1994): 2386-2389.
UMI ProQuest, General Periodicals Ondisc, item 02170720.

U.S. President. 1995. "Message to the Congress on Export
Controls." Weekly Compilation of Presidential Documents 31,
Iss. 32 (27 March 1995): 450-452. UMI ProQuest, General Pe-
riodicals Ondisc, item 02328904.

U.S. President. 1995. "Message to the Congress on Weapons of Mass
Destruction." Weekly Compilation of Presidential Documents
31, Iss. 45 (13 November 1995): 1991-1994. UMI ProQuest,
General Periodicals Ondisc, item 02642999.